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paticae. Our knowledge of the distribution of species is very much limited. We know next to nothing of the Hepaticae of the entire range of the Rocky Mountains south of northern Idaho, and Mr. Leiberg and others who have sent in considerable quantities of interesting plants from farther north have only shown us the stores of information awaiting the collector in that region. Colorado, Utah, the Sierras from Oregon southward, and all the Southwest from Missouri to Texas, New Mexico and Arizona are a great unknown, no less among all of the lower cryptogams than in the Hepaticae. Much more needs to be done throughout all the States of the Mississippi valley, and especially the southern extension of the Appalachian area, which needs the careful attention of the resident observer, rather than the hasty notes of the transient collector. It is hoped that the above synopsis and descriptions will be sufficient to provide for any student of the group the ready means of identifying his material; we shall be pleased to receive doubtful material, or that illustrating additional facts of distribution.

NEW YORK, 24 September, 1896.

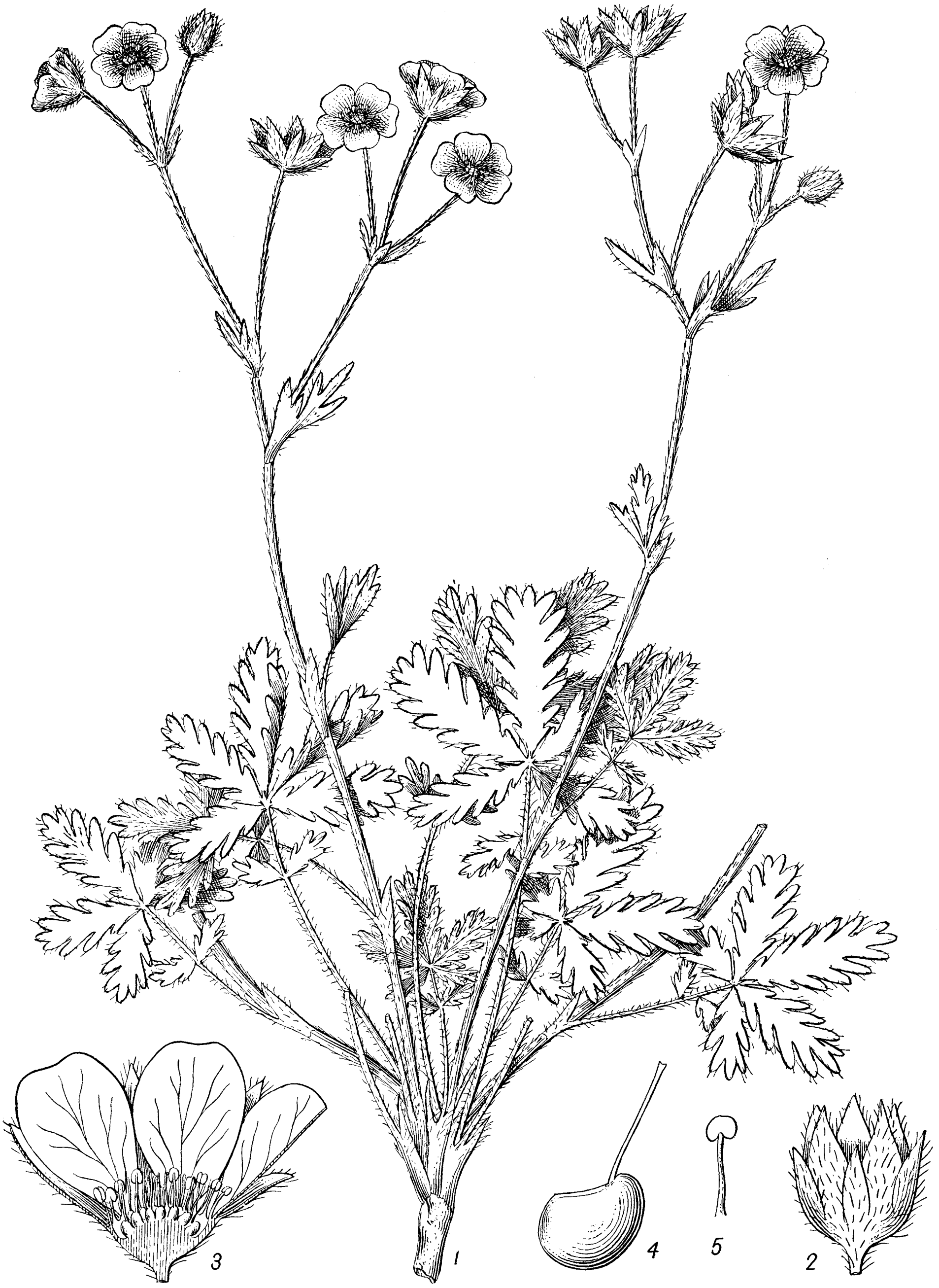
# Notes on Potentilla.—IV.

BY P. A. RYDBERG.

(Plates 274 and 275.)

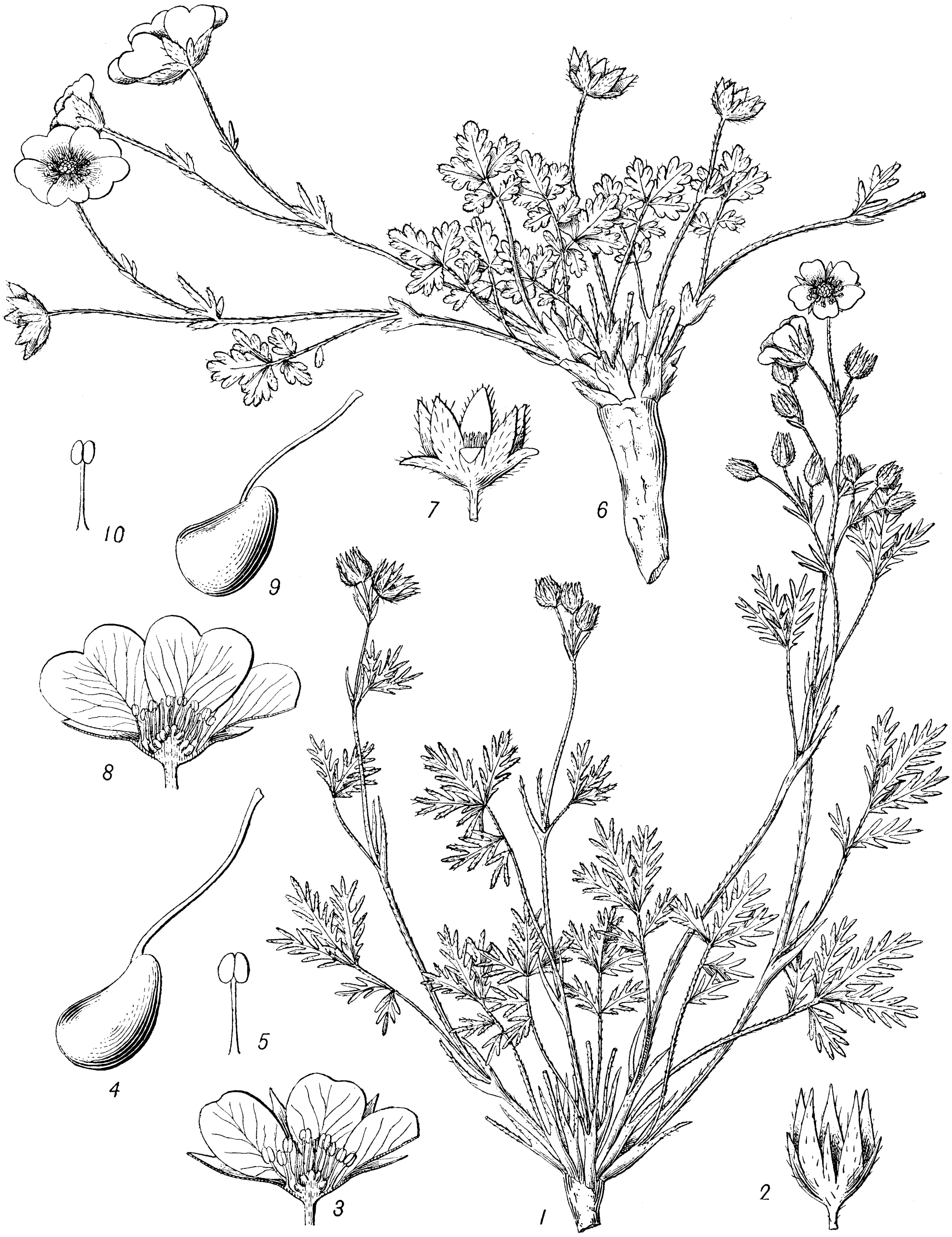
The *Aureae* resemble much the *Frigidae* except that the leaves have more than three leaflets. They are all low plants, generally less than 2 cm. high, except *P. dissecta*, which sometimes reaches a height of 3 cm. The pubescence is scant, silky, strigose or hirsute, only in a variety of *P. dissecta* a little tomentose on the lower surface of the leaves, and the plant often becomes glabrous and shining in age. The style in all is very slender and filiform, fastened near the apex of the achene and generally much longer than the achene. Most of the species belonging to this group have truly digitate leaves, but in the North American representatives the outer leaflets are often inserted lower down and the leaves become pinnate with approximate leaflets.

BULLETIN OF THE TORREY BOTANICAL CLUB.—PLATE 274.



POTENTILLA SUBJUGA RYDB.

BULLETIN OF THE TORREY BOTANICAL CLUB.—PLATE 275.



1–5 POTENTILLA TENERRIMA RYDB. 6–10 P. MINUTIFOLIA RYDB.

POTENTILLA RUBENS (Crantz) Vill. Prosp. Fl. Dauph. 46. 1779.

*P. maculata* Pourr. Act. Toloss. 3: 326. 1788.

This species comes very near the *Frigidae*, especially to *P. nana* and *P. Friesiana*. From the latter it differs little except in the number of leaflets. The leaves are much smaller than those of the other American *Aureae*, the leaflets being only 10–20 mm. long. The sepals are broadly ovate, while in the rest they are ovate-lanceolate or lanceolate. *P. rubens* grows in arctic and alpine regions of Europe, in Greenland, the Baffin Bay region and Labrador.

POTENTILLA DISSECTA Pursh, Fl. Am. Sept. 355. 1814.

*P. diversifolia* Lehm. Nov. Stirp. Pug. 2: 9. 1830.

It would be much better if Lehmann's name were used for this species, as this, without any doubt, belongs to it. As to *P. dissecta* Pursh, nobody seems to know absolutely what it is. Dr. Watson thought it to be the same as *P. diversifolia* Lehm. Lehmann had seen *P. dissecta* in Bank's herbarium, but thought that his *P. diversifolia* was different. Not being able to settle the matter satisfactorily, the author thinks it best for the present not to make a change in the "accepted" nomenclature, although *P. diversifolia* is a good name, and available, and besides has the advantage of belonging to this plant without any doubt.

To the author it seems as if *P. dissecta* rather belonged to *P. multisecta* (see below) or to *P. Ranunculus*. Lange's description and figure of the latter in Flora Danica, and the only specimen seen by me agrees much better with Pursh's description of *P. dissecta* than the present species does.

Dr. Watson included in his *P. dissecta*, with varieties, not less than five different plants, which I believe are all good species, viz.: *P. diversifolia* Lehm, *P. decurrens* (Wats.), *P. multisecta* (Wats.), *P. pinnatisecta* (Wats.) Aven Nelson, and *P. Drummondii* Lehm. These will be discussed further below. He also included *P. rubricaulis* Lehm.; I have not seen any authentic specimens of that. There are two forms that fairly agree with Lehmann's description and figure of *P. rubricaulis*. One differs from *P. diversifolia* Lehm. only in being smaller and with the leaves slightly whitened beneath. Following Gray and Watson, I have taken this to be *P.*

*rubricaulis* Lehm. and have made it a variety of the present species. I regard the other form as a new species and it will be discussed later.

*P. dissecta* varies much in the form of the leaves. In the type of *P. diversifolia* Lehm. the lower leaves were pinnate with approximate leaflets, but all the leaves are as often perfectly digitate. The leaflets are larger than in the other related species, oblanceolate, and generally seven in number. In the typical form they are generally appressed-hairy. All specimens seen are from the plain and mountain regions of the West, the range extending from Colorado to California, British Columbia and Saskatchewan.

### POTENTILLA DISSECTA GLAUCOPHYLLA (Lehm.) Wats. Proc. Am. Acad. 7: 556. 1873.

*P. diversifolia glaucophylla* Lehm. Rev. Pot. 73. 1856.

Leaves nearly glabrous, glaucous-green and always digitate.

The range is the same as that of the species, but it is much more common within the United States.

### POTENTILLA DISSECTA RUBRICAULIS (Lehm.).

*P. rubricaulis* Lehm. Nov. Stirp. Pug. 2: 11. 1830.

Leaves somewhat tomentose beneath when young. It may be a hybrid between *P. dissecta* and *P. nivea* or *P. concinna*, as it is rare and only found in the mountains, where these species also grow.

### POTENTILLA DECURRENS (Wats.).

*P. dissecta decurrens* Wats. Proc. Am. Acad. 7: 557. 1873.

This species much resembles the preceding, especially the var. *glaucophylla*, but it is a more cespitose plant and has smaller and thicker leaves with prominent veins beneath. The leaflets are generally five and the lower often attached a little lower down and decurrent on the petioles, but this is not always the case by far. It is found in the higher moutains of Utah, Wyoming and Montana.

*Potentilla Ranunculus* Lange, Fl. Dan. *pl. 2964*, from Greenland, comes near to both the preceding, differing from both in the more deeply dissected leaves and scaly rootstock. The leaves resemble much those of *P. decurrens*, but are perfectly digitate and much thinner. It seems to be a very rare plant.

*Potentilla ranunculoides* Humb. & Bonp.; Nestl. Monog. Pot. 56, of Mexico, belongs also to this group, differing from the North American species by its large petals and very broad rounded leaflets.

### POTENTILLA MULTISECTA (Wats.).

*P. diversifolia multisecta* Wats. King's Rep. **5**: 86. 1871.

This was also included in *P. dissecta* by Watson. It is a probability that it is the original *P. dissecta* Pursh, the description of which fits this, as well as *P. Ranunculus* Lange, better than the plant for which the name is used, viz. *P. diversifolia* Lehm. From this, *P. multisecta* differs not only in the finely dissected leaves, but also in the smaller flowers. The leaves are not truly digitate, but the outer leaflets are attached a little lower, as in *P. decurrens*. All are divided into linear divisions. This species therefore connects the *Aureae* with the *Multijugae*, especially with *P. pinnatisecta* and *P. millefolia*. It ranges from Nevada to Montana and Wyoming.

A small group, nearly related to the *Aureae*, especially to *P. decurrens* and *P. multisecta*, but with the leaves more or less tomentulose beneath may be known as the *Subjugae*. The leaves are at the same time digitate and pinnate, *i. e.*, they are digitately 3–5-foliolate with a pair (in the last sometimes 2 pairs) of smaller leaflets further down on the petiole. In this respect they resemble *P. pulchella*, from which the *Subjugae* differ in the style, which is filiform. They are all low and tufted, or cespitose, delicate plants from Colorado, less than 2 dm. high, except the first, which sometimes reaches 3 dm. It approaches in size and habit the *Gracilis* group, *i. e.*, *P. gracilis* and its varieties as understood by Watson. Strangely, all four seem to be undescribed.

### POTENTILLA SUBJUGA n. sp.

Tufted from a perennial root; stems many, 1–3 dm. high, silky-villous, few-leaved, rather divergently branched above, the lower portion covered with the brown scarious lower stipules; upper stipules green, ovate, entire. Basal leaves many, digitately 5- (seldom 3-) foliolate with an additional pair of smaller leaflets on the petiole, about 1 cm. below the others; leaflets 1–4 cm. long, oblong or obovate, deeply incised into oblong rather obtuse segments, silky and green above, silky and white-tomentose beneath; stem-leaves generally ternate, few and reduced in size; calyx silky-hirsute, in fruit 5–8 mm. in diameter; bractlets oblong, obtuse or acute, about ⅓ shorter than the ovate triangular acuminate sepals; petals broadly obcordate exceeding the sepals; stamens about 20; style filiform, nearly terminal; achenes smooth. (Plate 274.)

As before noted it resembles somewhat the species of the *Gracilis* group, especially *P. fastigiata* in size and *P. pulcherrima* in the form of the leaflets and the pubescence. The latter has digitate or more or less pinnate leaves with approximate leaflets, but they are never, as in *P. subjuga*, digitately 5-foliolate with a pair of smaller ones some distance below. In *P. subjuga*, the leaflets are more deeply incised and the stem and branches stricter and the latter rather divergent; they are few-flowered,* as in *P. nivea*, from which it differs in the number of the leaflets.

*Colorado*: N. H. Patterson, no. 192, 1892 (from near Empire, type); 1885 (from Gray's Peak); C. S. Crandall, no. 184, 1892 (from Graymont); T. C. Porter, no. 44; Hall and Harbour, no. 160, 1862, mainly.

### POTENTILLA TENERRIMA n. sp.

Tufted from a perennial root; stems many, very slender, generally tinged with red, 1–1½ dm. high, sparingly strigose; stipules linear, lanceolate, acuminate, about 1 cm. long, the lower scarious and brown. Leaves digitately 3-foliolate, with a pair of smaller leaflets below, or, which is the same, pinnate of 2 pairs and terminal leaflet sessile, finely silky and a little grayish tomentulose beneath; leaflets obovate or oblanceolate in outline, divided to near the midrib into linear acute segments; flowers on slender pedicels, nearly 1 cm. in diameter; calyx silky-strigose, in fruit ½ cm. in diameter; bractlets linear, acute, very little shorter than the narrowly lanceolate sepals; petals obovate, slightly retuse, a little exceeding the sepals; stamens about 20; style filiform, nearly terminal; achenes smooth. (Plate 275, figs. 1–5).

It resembles a very slender form of the preceding, but the terminal leaflets, as in the two next, are always only three. The segments of the leaflets are also much narrower, as also the bracts and sepals, which are narrower than in any other North American species.

*Colorado:* Brandegee, no. 950, 1874 (from Bergen's Park, type); Hall and Harbour, no. 160 (in part, in the Harvard herbarium).

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* *P. rubricaulis* Lehm. may perhaps be a form of this with only 3 terminal leaflets and more erect branches.

### POTENTILLA MINUTIFOLIA n. sp.

Cespitose, stems about 1 dm. long, slender, 1–2-leaved, sparingly silky or nearly glabrous, slightly striate; stipules ovate-lanceolate, the lower scarious and brown; basal leaves very small, on slender petioles 3–5 cm. long, silky-hirsute, slightly grayish beneath, pinnate, of two pairs of leaflets, the upper pair and the sessile odd leaflet about ½ cm. long; the lower pair only 2–3 mm.; leaflets obovate, incised, with oval rounded segments; flowers 1–2, about 15 mm. in diameter; calyx sparingly hirsute, in fruit 7–8 mm. in diameter; bractlets oblong, generally obtuse, about half as long as the oblong-lanceolate obtuse or acutish sepals; petals obcordate, about ½ longer than the sepals. (Plate 275, figs. 6–10.)

This somewhat resembles *P. subjuga*, but differs in the small size of the plant and of the leaves, the three terminal leaflets, and their short and rounded segments.

*Colorado*: Wm. M. Canby (Pikes Peak) 1895.

### POTENTILLA SAXIMONTANA n. sp.

Densely cespitose; stems several, 1–3-flowered, less than 5 cm. long, silky pubescent. Basal leaves numerous, pinnate with 2–3 often approximate pairs of leaflets, silky pubescent and somewhat tomentose beneath, short-petioled; leaflets deeply dissected into oblong obtuse or acute segments; flowers about 1 cm. in diameter; calyx densely silky; bractlets oblong, obtuse, shorter than the broadly ovate-triangular sepals; petals broadly obcordate, much longer than the sepals; stamens about 20; style nearly terminal, about equalling the smooth achene.*

It somewhat resembles the preceding, but is still more cespitose, has much broader sepals and larger leaves, which have much shorter petioles. The leaves resemble somewhat those of *P. pinnatisecta* (Wats.) Aven Nelson (*P. ovina* Macoun), but are slightly tomentose. The flowers are much larger and the sepals much broader than in that species. It resembles also somewhat *P. Sommerfeltii*, but has much more dissected leaves, and the style is different. The following specimens have been examined:

*Colorado*: John Wolf, no. 366, 1873 (Wheeler's expedition, type); Hooker & Gray, 177 (Torrey's Peak); Knowlton, no. 19, 1896 (Pike's Peak).

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* The plate of this will appear in a subsequent number.